Change 1
Field Manual
No. 3-11.19/
Marine Corps Warfighting Publication
No. 3-37.4/
Navy Tactics, Techniques, and Procedures
No. 3-11.29/
Air Force Tactics, Techniques, and
Procedures (Interservice)
No. 3-2.44

Headquarters
Department of the Army
United States Marine Corps
United States Navy
United States Air Force
Washington, DC, *31 December 2008*

Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Reconnaissance

1. Change Field Manual (FM) 3-11.19/ Marine Corps Warfighting Publication (MCWP) 3-37.4/Navy Tactics, Techniques, and Procedures (NTTP) 3-11.29/ Air Force Tactics, Techniques, and Procedures (Interservice) (AFTTP[I]) 3-2.44, 30 July 2004, as follows:

Remove old pages:	**Insert new pages:**
vii and viii	vii and viii
xi and xii	xi and xii
J-15 and J-16	J-15 and J-16
N-1 through N-5	N-1 through N-4
Glossary-1 through Glossary-6	Glossary-1 through Glossary-6
Glossary-11 and Glossary-12	Glossary-11 and Glossary-12
Index-1 through Index-4	Index-1 through Index-4

2. A bar (|) marks new or changed material.

3. File this transmittal sheet in front of the publication.

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0833702

DISTRIBUTION:
Active Army, Army National Guard, and U.S. Army Reserve: To be distributed in accordance with the initial distribution number 115094, requirements for FM 3-11.19.

By Order of the Secretary of the Air Force

MAX E. KIRSCHBAUM
Colonel, USAF
Commander
Headquarters, Air Force Civil Engineer
Support Agency

Air Force Distribution: F

Marine Corps PCN: 143 000146 00

Page

TABLES

Page

- Ideal wind direction. When deployed in an area surveillance mission, the detector can be oriented toward the wind to warn of approaching chemical clouds.

(4) It is normal to plan at least three different sites for each surveillance mission—primary, alternate, and different.

- **Primary.** This is the actual location of the detector, with orientation upon the target area. It is usually the best site of those initially selected.
- **Alternate.** This is another site with the same target area. It is usually identified as an alternative to the primary site in the event that the first site is compromised and or comes under enemy fire.
- **Different.** This is a different location that is used to view a different target. It may be necessary because of a change in the plan for a surveillance mission or a change in the wind direction.

8. Sampling

a. Sampling operations are particularly important if a previously unknown agent is used or if the suspected use is the first use of a CB agent by a threat force. If the type of agent is unknown, the unit leader conducts an RA to provide safety for his unit (e.g., an unknown agent could potentially penetrate collective protection equipment). During the mission analysis for TIM reconnaissance, consider the availability of appropriate individual and collective protection. The collection of CB samples and the background information must be as detailed and comprehensive as possible. Each sample is processed and analyzed to provide data for intelligence analysts to use. The processing of CB samples includes collecting, handling, transferring, and maintaining the chain of custody.

b. Chemical samples are taken when directed by higher headquarters or when the sensor detects or identifies the presence of a chemical substance. Biological samples are taken when directed by higher headquarters. The NBCRS does not have biological detection capability, so take samples in an area where suspected contamination exists (look for dead animals and plants). Possible ground locations include low-lying areas, wet or damp terrain, and shady areas. Grassy terrain provides better quality samples than rocky terrain.

c. Plan sampling operations in advance, and use the following steps to take CB samples:

Step 1. Perform preventive-maintenance checks and services on all equipment.

Step 2. Remove sample bottles, and mark them with control numbers using a china or indelible marker (see *Appendix E*).

Step 3. Enter all sample bottle numbers in the crew logbook.

Step 4. Take at least two samples about 500 meters upwind of the sample area. These are known as *background samples* that are not contaminated. They are used as comparison samples to ensure that a compound is not naturally found in the area.

Step 5. Enter the contaminated area, and identify the sample (dirt, vegetation).

Step 6. Mount the protective work glove into the work port.

Step 7. Insert your left arm into the work glove.

Step 8. Release the latch on the sample tray, and pull the tray out to the fully extended position.

Step 9. Remove the cap from the sample bottle.

Step 10. Grasp the gripper tongs by the handle and slide them out of the tray.

Step 11. Watch through the floor window, and use the tongs to grasp the sample and place it in a sample bottle.

Step 12. Replace the tongs on the tray.

Step 13. Replace the cap on the sample bottle.

Step 14. Transfer the samples to the proper organization (e.g., technical intelligence collection point).

NOTE: A soil sample should weigh about 10 grams, and a liquid sample should be 15 to 25 milliliters.

d. A sample collected from an area is significant, but it can become useless if proper steps are not taken to record critical information about its collection. See *Appendix* E for the proper procedures for recording the information.

e. After the NBCRS team takes the samples and arrives at the decontamination site, it conducts a sample change of custody at a site or grid coordinate established by the controlling headquarters. The controlling headquarters is responsible for getting personnel to the site to effect the transfer. Samples are passed through the glove port to receiving personnel, who are typically technical intelligence or escort teams. The following items should accompany the samples:

- Information contained in the crew's mission log.
- Printout from the MM1.
- Chain-of-custody form.

9. Unit Employment

NBC reconnaissance units are employed to enhance combat power. Combat power is the ability to fight; and it is achieved by combining maneuver, firepower, protection, and leadership.

a. Employment Guidelines.

(1) Task-organize NBC reconnaissance units based on the mission and the type of unit being supported (e.g., battalion, regiment). NBC reconnaissance units are concentrated and weighted with the main effort to help ensure success, but there are never enough units to handle all tasks. Concentrating NBC reconnaissance assets can

Appendix N

MOUNTED CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR RECONNAISSANCE OPERATIONS

1. Background

This appendix addresses the capabilities and employment of the NBCRS, which includes the M93A1 Fox (used by the USA and USMC) and the Stryker NBCRV (used by the USA). The Stryker NBCRV is the primary reconnaissance platform for the USA and is assigned to chemical CS companies, heavy brigade combat teams (HBCTs), and Stryker brigade combat teams (SBCTs).

2. Capabilities

a. NBCRS vehicles are capable of CBRN detection, presumptive identification, warning, and sampling. The sensor suites are integrated onto platforms and are capable of performing CBRN reconnaissance on primary, secondary, and cross-country routes throughout the battlefield. NBCRS vehicles are not fighting vehicles, but are designed for reconnaissance. They use mobility, stealth, speed, awareness, and communications as their primary capabilities; augment conventional reconnaissance operations while on the move; and use an overpressure system to provide a safe environment for crewmembers.

b. Table N-1 provides a comparison of mounted NBCRSs.

Table N-1. Mounted NBCRS Capabilities

Capability	M93A1 Fox	Stryker NBCRV
Crew	3 crewmembers (commander, driver, and surveyor)	4 crewmembers (commander, driver, and 2 surveyors)
Point detection (chemical liquid)	MM1	CBMS II
Point detection (chemical vapor)	M22 ACADA CAM/ICAM MM1	M22 ACADA (operational on the move) CAM/ICAM
Standoff detection (chemical vapor)	M21 RSCAAL (stationary; no scan capability)	JSLSCAD (mobile; scan capability)
Point detection sampling (vapor)	None	CVSS (chemical) JBPDS (biological)
Point detection (biological aerosol)	None	JBPDS (stationary)
Point detection (radiation)	AN/VDR-2	AN/VDR-2
Mobile detection (chemical/ radiation), up to 45 kph	Yes	Yes
Overpressure	Yes	Yes
Environmental control	Yes	Yes
Sample storage	Yes	Yes
Data storage	Yes	Yes

Table N-1. Mounted NBCRS Capabilities (Continued)

Capability	M93A1 Fox	Stryker NBCRV
Ground temperature sensor	Yes	Yes
Meteorological sensor	Yes	Yes
Navigation	GPS and ANAV	GPS and FBCB2
Standard NATO Marking System	Yes	Yes
Downwind hazard plotting	No	Yes
Recovery capability	Yes	Yes
CLS	Yes	Yes
Armor	7.62-mm armor plate	14.5-mm armor plate
Weapon	7.62-mm M240 machine gun	Remote weapons station .50 caliber M2 machine gun
Swimming	Yes	No
Self-protective smoke	No	Yes
Transmission factor	0.20	0.11
Mobility consistent with supported forces	Yes	Yes

3. Planning Considerations

a. When operating in uncertain or hostile environments, mounted NBCRSs will normally conduct a more rapid search if augmented by security elements. However, the security elements may not have the same hazard protection (overpressure systems).

b. Address the following planning considerations before deploying for mounted reconnaissance operations:

- While conducting movement to the area of interest, the security element may lead the convoy to provide complete protection for the team. This should only take place from the assembly area to the background sample area before approaching the area of interest.
- Upon reaching the background sample area, a mounted NBCRS should take the lead and the security element should provide overwatch. This will limit the amount of personnel and equipment that could become contaminated. Security elements should always remain in an uncontaminated environment if possible.
- After the mission is complete, the security element can provide overwatch (without becoming contaminated) for personnel traveling to or waiting for the decontamination element.

4. Employment Considerations

a. Although there are various types of CBRN reconnaissance organizations, the basic building block or most optimal employment method of CBRN reconnaissance organizations is in pairs. All unit variations generally follow the same doctrinal employment concept.

b. A mounted CBRN reconnaissance unit can be employed to operate centralized or decentralized, depending on METT-TC factors, to respond to threats over a large area. A flexible task organization facilitates CBRN ISR throughout the depth and width of the battlefield. Mounted NBCRSs normally operate in one of three configurations—team, squad, or section/platoon—and supported units must be familiar with mounted CBRN reconnaissance unit capabilities.

(1) Team. The team configuration (Figure N-1) is used when the mounted NBCRS operates by itself, without the support of another platform. For most CBRN reconnaissance organizations, this is not the optimal employment method; however, it is the normal configuration for the SBCT reconnaissance platoon. This decentralized configuration is designed to perform multiple CBRN reconnaissance missions over vast areas (50 by 50 kilometers) in a noncontiguous environment. Potential missions include the surveillance of key fixed sites and environmental and industrial hazards.

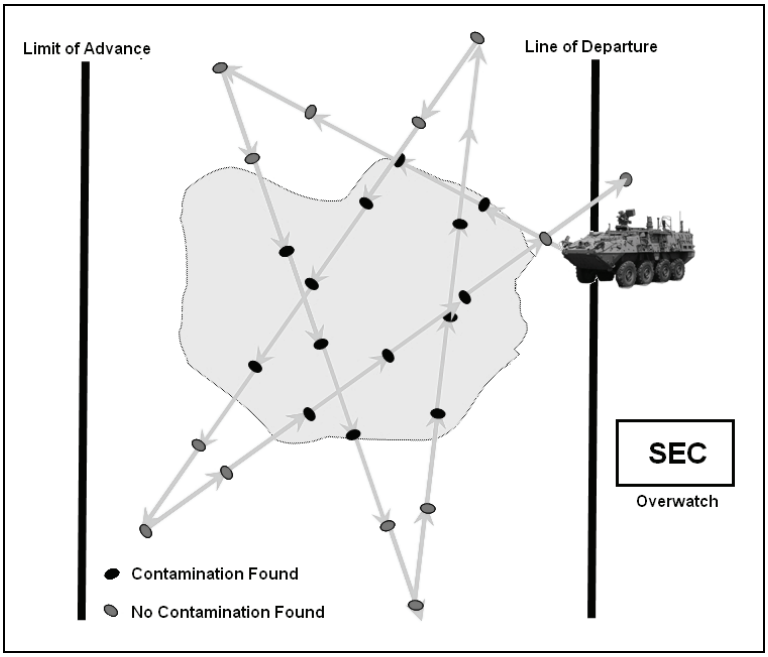

Figure N-1. Sample Team Configuration

(2) Squad. The squad configuration (Figure N-2, page N-4) is used when the mounted NBCRS operates in pairs, which is the optimal organization under most conditions (route, large area). The vehicle sensors complement each other to maximize contamination avoidance. Squads can quickly find bypass routes around contamination to prevent the loss of mobility (assured mobility). A third vehicle is utilized for CBRN surveillance operations oriented on NAIs developed during the IPB process, overwatch on key fixed sites, and assistance with large-area missions.

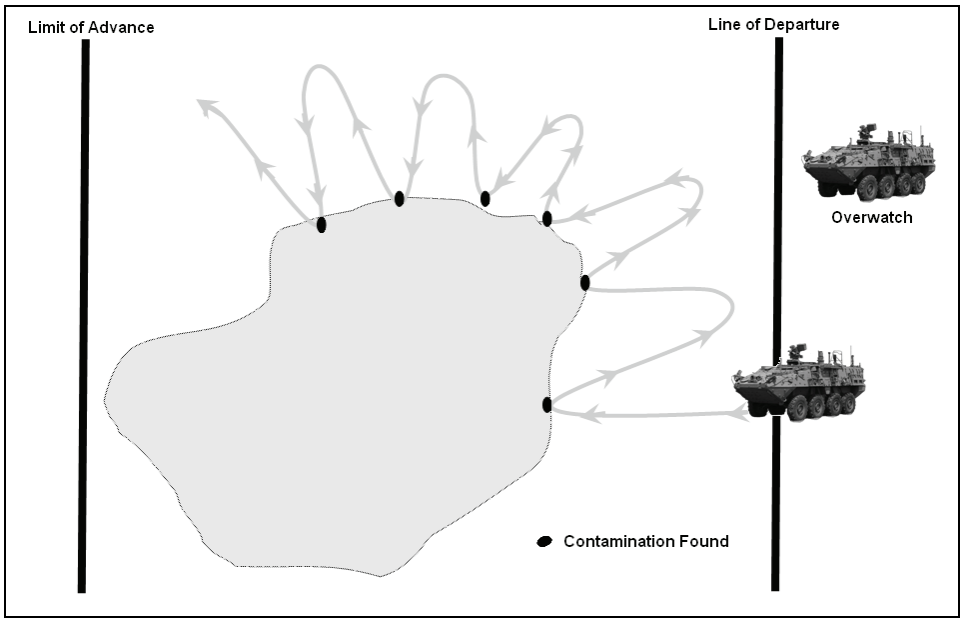

Figure N-2. Sample Squad Configuration

(3) Section/Platoon. In the section/platoon configuration (Figure N-3), three mounted NBCRSs operate in unison. These combined missions may be necessary for large SPODs or APODs or in strategically located key areas where numerous vehicles are required. This option allows for quick CBRN reconnaissance and the marking of large areas when needed.

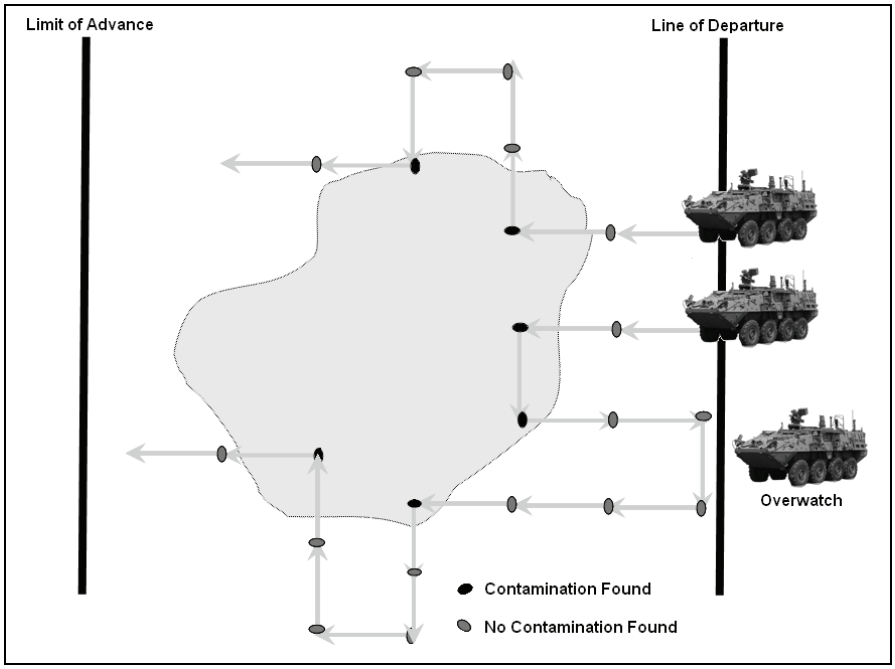

Figure N-3. Sample Section/Platoon Configuration

GLOSSARY

PART I—ABBREVIATIONS AND ACRONYMS

µ	micron(s)
µg	microgram
A	
AA	avenue of approach
AAR	after-action report
AB	air base
AC	alternating current
ACAA	automatic chemical-agent alarm
ACADA	automatic chemical-agent detection alarm
ACR	armored cavalry regiment
AEP	allied engineering publication
AFB	Air Force base
AFDD	Air Force doctrine document
AFH	Air Force handbook
AFI	Air Force instruction
AFJMAN	Air Force joint manual
AFM	Air Force manual
AFMAN	Air Force manual
AFPAM	Air Force pamphlet
AFPD	Air Force policy directive
AFR	Air Force regulation
AFSC	Air Force specialty code
AFTTP(I)	Air Force tactics, techniques, and procedures (interservice)
AGCF	air-ground correlation factor
AL	Alabama
ANAV	autonomous navigation

AO	area of operations
AOB	advanced operations base
AOI	area of interest
AOR	area of responsibility
APC	armored personnel carrier
APO	Army post office
APOD	aerial port of debarkation
APOE	aerial port of embarkation
AR	Arkansas
AR	Army regulation
ASAP	as soon as possible
AT	antiterrorism
ATP	allied tactical publication
ATTN	attention
AZ	azimuth
B	
BDA	battle damage assessment
BDOC	base defense operations center
BEEF	base engineer emergency force
BIDS	Biological Integrated Detection System
bn	battalion
BSA	brigade support area
BW	biological warfare
C	
C	Celsius
C2	command and control
CAM	chemical-agent monitor
CARVER	criticality, accessibility, recuperability, vulnerability, effect, recognizability
CB	chemical and biological
CBIAC	Chemical and Biological Information Analysis Center

CBIRF	chemical-biological incident response force
CBMS	chemical-biological mass spectrometer
CBR	chemical, biological, and radiological
CBRN	chemical, biological, radiological, and nuclear
CBRNE	chemical, biological, radiological, nuclear, and high-yield explosives
CCA	contamination control area
CCIR	commander's critical information requirements
CDC	Centers for Disease Control and Prevention
CE	civil engineering
CF	correlation factor
CG	commanding general
cGyph	centigray per hour
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CLS	contracted logistics support
cm	centimeter(s)
CM	chemical
co	company
CO	commanding officer
COA	course of action
COCOM	combatant command
COMM	commercial
COMMZ	communications zone
CONOPS	concept of operations
C ONUS	continental United States
COP	common operational picture
CP	counterproliferation
CRD	chemical reconnaissance detachment
CS	combat support
CSS	combat service support
CT	counterterrorism

CVSS	chemical-vapor sampler system
CW	chemical warfare
D	
DA	Department of the Army
DC	District of Columbia
DC	direct current
DCC	damage control center
dd	date
DD	Department of Defense
decon	decontamination
deg	degrees
det	detachment
DHHS	Department of Health and Human Services
dir	direction
div	division
DNA	deoxyribonucleic acid
DOD	Department of Defense
DODD	Department of Defense directive
DOS	Department of State
DOT	Department of Transportation
DS	direct support
DSA	division support area
DSN	Defense Switched Network
DTG	date-time group
E	
EAC	echelons above corps
EEFI	essential elements of friendly information
EL	elevation
e-mail	electronic mail
EMP	electromagnetic pulse
EOC	emergency operations center

EOD	explosive ordnance disposal
ERT	emergency response team
F	
F	Fahrenheit
FBCB2	Force XXI battle command–brigade and below
FDPMU	forward-deployable, preventive-medicine unit
FEMA	Federal Emergency Management Agency
FHP	force health protection
FID	foreign internal defense
FL	Florida
FM	field manual
FMFM	Fleet Marine Force manual
FOB	forwarding operating base
FOV	field of view
FP	force protection
FPO	Fleet post office
FRAGORD	fragmentary order
ft	foot, feet
FY	fiscal year
g	gram(s)
G	
gal	gallon(s)
GENTEXT	general text
GPS	global positioning system
GS	general support
H	
H	time of attack
HAZMAT	hazardous materials
HBCT	heavy brigade combat team
HE	high explosive

HC	hexachloroethane
HHC	headquarters and headquarters company
HHD	headquarters and headquarters detachment
HMMWV	high-mobility, multipurpose wheeled vehicle
HN	host nation
HQ	headquarters
HSS	health service support
HVAC	heating, ventilation, and air conditioning
HVT	high-value target

I

IATA	International Air Transport Association
IC	incident commander
IC	interim change
ICAM	improved chemical-agent monitor
ID	identification
IDLH	immediately dangerous to life or health
IED	improvised explosive device
in	inch(es)
inf	infantry
IPB	intelligence preparation of the battlespace
IR	information requirements
ISO	International Organization for Standardization
ISR	intelligence, surveillance, and reconnaissance

J

J5	plans directorate of a joint staff
JBPDS	Joint Biological Point Detection System
JFC	joint force commander
JOA	joint operations area
JP	joint publication
JRA	joint rear area

reg	regimental
RI	Rhode Island
RM	risk management
ROE	rules of engagement
RSCAAL	remote-sensing, chemical-agent alarm
RSTA	reconnaissance, surveillance, and target acquisition
S	
SA	situational awareness
SALUTE	size, activity, location, unit, time, and equipment
SBCT	Stryker brigade combat team
SCUD	surface-to-surface missile system
sec	section
SecDef	Secretary of Defense
SEC	security
SEM	sensor electronics module
SF	special forces
SFG	special forces group
SFOB	special forces operations base
SFOD	special forces operational detachment
SMART-CB	special medical augmentation response team–chemical
and biological	
SME	subject matter expert
smk	smoke
SOF	special operations forces
SOP	standing operating procedure
SPOD	seaport of debarkation
SPOE	seaport of embarkation
spt	support
sq	square
sqd	squad
SR	special reconnaissance
SRC	survival recovery center
STANAG	standardization agreement (NATO)
STP	soldier training publication

T

TA	theater Army
TAI	target area of interest
TBM	theater ballistic missile
TC	training circular
TEU	technical escort unit
TF	task force
TFA	toxic-free area
TG	training guide
TIC	toxic industrial chemical
TIM	toxic industrial material
TL	team leader
TLV	threshold limit value
TM	technical manual
TO	technical order
TO	theater of operations
TOB	time of burst
TOC	tactical operations center
TOE	table(s) of organization and equipment
TPFDL	time-phased force and deployment list
TRADOC	United States Army Training and Doctrine Command
TSP	training support package
TTP	tactics, techniques, and procedures
TX	Texas

U

U	unclassified
UN	United Nations
US	United States

INDEX

PIN: 081653-001